Assessment Schedule

Statistics and Modelling: Use probability distribution models to solve straightforward problems (90646)

Evidence Statement

	Achievement Criteria	Q.	Evidence	Code	Judgement	Sufficiency
Achievement	Use probability distribution models to solve straight-forward problems.	1	Normal distribution P ($x < 3$) = P($z < -1.2$) = 0.5 – 0.3849 = **0.115**	A	Or equivalent. Accept CRO.	***Achievement:*** Two of Code A. No repeated distributions allowed as evidence.
		2	Poisson distribution P ($x > 1$; $\lambda = 2$) = 1 – (0.1353 + 0.2707) = **0.594**	A	Or equivalent. Accept CRO.	
		3 (a)	Binomial distribution P ($x \leq 2$; $n = 10$, $\pi = 0.15$) = 0.1969 + 0.3474 + 0.2759 = **0.820**	A	Or equivalent. Accept CRO.	
Achievement with Merit	Use probability distribution models to solve problems.	3 (b)	Binomial distribution P (1 in each group) = 0.3993 × 0.3847 = **0.154**	A M	Or equivalent. Accept CRO. NB: either probability could provide further evidence for A.	***Merit:*** Achievement **plus** Two of Code M **OR** Three of Code M.
		4	Normal distribution E(T) = 3 + 3 = 6 $\sigma(T) = \sqrt{0.4^2 + 0.4^2}$ $= \sqrt{0.32} = 0.5657$ P ($T > 7$) = P ($z > 1.768$) = 0.5 – 0.4615 = **0.0385**	A M	Or equivalent. Accept CRO.	
		5	Normal distribution P($z < a$) = 0.12 $a = -1.175$ x = **185.85** g	A M	Or equivalent. Accept CRO.	

	Achievement Criteria	Q.	Evidence	Code	Judgement	Sufficiency
Achievement with Excellence	Use and justify probability distribution models to solve complex problems.	6	<u>Method 1:</u> For the first researcher $\bar{x} = 2.6$ for 1 hectare So take $\mu = 2.6$ ($= \lambda$) For the second researcher $P(x = 0) = 0.522$ so $\frac{e^{-\lambda} \cdot \lambda^0}{0!} = 0.522$ $\Rightarrow e^{-\lambda} = 0.522$ $\Rightarrow \lambda = 0.65$ Number of hectares needed $= 0.65 \div 2.6$ $=$ **0.25** <u>Method 2:</u> For the first researcher $P(x = 0) = \frac{4}{145}$ so $\frac{e^{-\lambda} \cdot \lambda^0}{0!} = \frac{4}{145}$ $\Rightarrow e^{-\lambda} = \frac{4}{145}$ $\Rightarrow \lambda = 3.59$ For the second researcher $P(x = 0) = 0.522$ so $\frac{e^{-\lambda} \cdot \lambda^0}{0!} = 0.522$ $\Rightarrow e^{-\lambda} = 0.522$ $\Rightarrow \lambda = 0.65$ Number of hectares needed $= 0.65 \div 3.59$ $=$ **0.181**	A M E A M E	One inverse Poisson calculation could provide further evidence for A or M. Or equivalent. Working required. One inverse Poisson calculation could provide further evidence for A or M. Or equivalent. Working required.	***Excellence:*** Merit **plus** Code E.

Judgement Statement

Statistics and Modelling: Use probability distribution models to solve straightforward problems (90646)

Achievement	Achievement with Merit	Achievement with Excellence
Use probability distribution models to solve straightforward problems. 2 × A No repeated distributions	Use probability distribution models to solve problems. Achievement *plus* 2 × M **OR** 3 × M	Use and justify probability distribution models to solve complex problems. Merit *plus* 1 × E